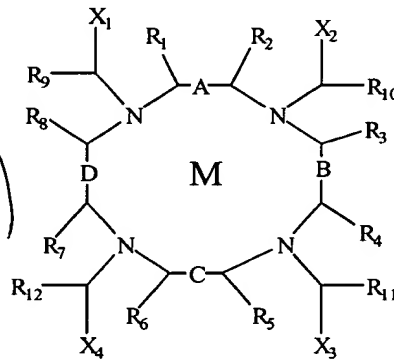


CLAIMS

We claim:

1. An MRI agent comprising:
 - a) a Gd(III) ion bound to a chelator such that said Gd(III) ion has coordination atoms in at least 5 coordination sites of said Gd(III) ion;
 - b) a blocking moiety covalently attached to said chelator which hinders the rapid exchange of water in the remaining coordination sites;
 wherein said blocking moiety is capable of interacting with a target substance such that the exchange of water in the remaining coordination sites is increased.

2. An MRI agent having the formula:



wherein

M is a paramagnetic metal ion selected from the group consisting of Gd(III), Fe(III), Mn(II), Yt(III), Cr(III) and Dy(III);

A, B, C and D are either single bonds or double bonds;

- 15 X₁, X₂, X₃ and X₄ are -OH, -COO-, -CH₂OH -CH₂COO-, or a blocking moiety;

R₁ - R₁₂ are hydrogen, alkyl, aryl, phosphorus moiety, or a blocking moiety;

wherein at least one of X₁-X₄ and R₁ - R₁₂ is a blocking moiety.

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3. An MRI agent comprising:

a) at least a first paramagnetic metal ion bound to a first complex, said first complex comprising:

i) a first chelator; and

ii) a blocking moiety covalently attached to said first chelator which binds in at least a first coordination site of said first metal ion and which is capable of interacting with a target substance such that the exchange of water in at least said first coordination site of said first metal ion is increased; and

b) at least a second paramagnetic metal ion bound to a second complex, said second complex comprising:

i) a second chelator; and

ii) a blocking moiety covalently attached to said second chelator which binds in at least a first coordination site of said second metal ion and which is capable of interacting with a target substance such that the exchange of water in at least said first coordination site of said second metal ion is increased.

4. An MRI agent comprising at least a first MRI duplex moiety comprising:

a) a first chelator comprising a first paramagnetic metal ion;

b) a second chelator comprising a second paramagnetic metal ion;

c) a blocking moiety covalently attached to at least one of said first or said second chelators, said blocking moiety providing at least a first coordination atom of each of said first and said second metal ions and which is capable of interacting with a target substance such that the exchange of water in at least a first coordination site in at least one of said metal ions is increased.

5. A composition comprising a polymer comprising at least one covalently linked MRI contrast agent comprising a paramagnetic metal ion bound to a complex, said complex comprising:

a) a chelator; and

b) a blocking moiety covalently attached to said chelator which binds in at least a first coordination site of said metal ion and which is capable of interacting with a target

substance such that the exchange of water in at least said first coordination site is increased.

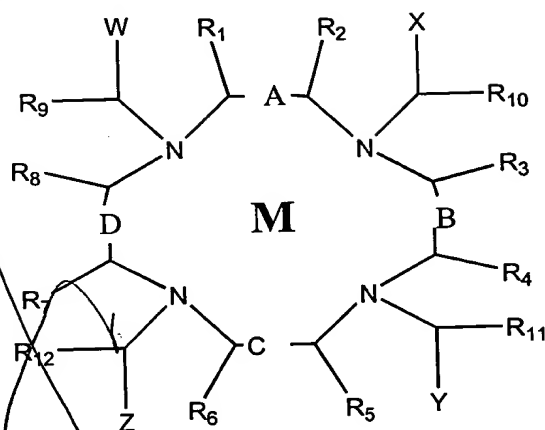
6. A MRI agent comprising a paramagnetic metal ion bound to a complex, said complex comprising:

- 5 a) a chelator; and
b) a blocking moiety covalently attached to said chelator which binds in at least a first coordination site of said metal ion and which is capable of interacting with a target substance such that the exchange of water in at least said first coordination site is increased.

10 7. A MRI agent comprising

- a) a paramagnetic metal ion capable of binding n coordination atoms, wherein said metal ion is bound to a chelator such that said metal ion has coordination atoms at $(n-1)$ or $(n-2)$ coordination sites of said metal ion; and
b) a blocking moiety covalently attached to said chelator that hinders the rapid
15 exchange of water in the remaining coordination site or sites,
wherein said blocking moiety is capable of interacting with a target substance, such that the exchange of water at the remaining coordination site or sites is increased.

8. A MRI agent having the formula comprising:



wherein

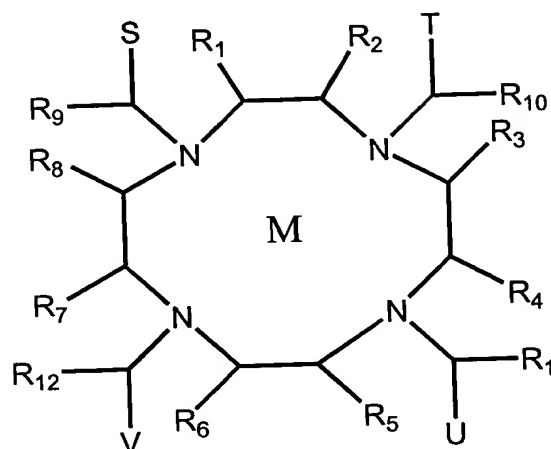
M is a paramagnetic metal ion selected from the group consisting of Gd(III), Fe(III), Mn(II), Yt(III), Cr(III) and Dy(III);

5 A, B, C and D are either single bonds or double bonds;

W, X, Y and Z are -OH, -COO-, -CH₂OH or -CH₂COO-;

R₁ - R₁₂ are hydrogen, alkyl, substituted alkyl, phosphorus moiety, or a blocking moiety; wherein at least one of R₁ - R₁₂ is a blocking moiety.

9. A MRI agent having the formula comprising:



wherein

M is a paramagnetic metal ion selected from the group consisting of Gd(III), Fe(III), Mn(II), Yt(III), Cr(III) and Dy(III);

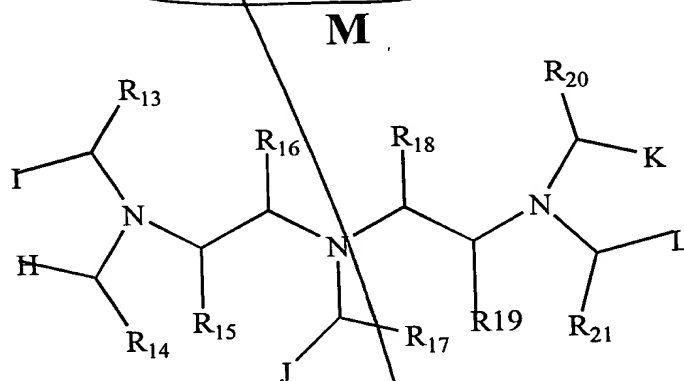
5 A, B, C, and D are either single or double bonds;

S, T, U and V are $-OH, -COO-, -CH_2OH, -CH_2COO-$, or a blocking moiety;

$R_1 - R_{12}$ are hydrogen, alkyl, substituted alkyl, or phosphorus moiety;

wherein at least one of S, T, U or V is a blocking moiety.

10. A MRI agent having the formula comprising:



10 wherein

M is a paramagnetic metal ion selected from the group consisting of Gd(III), Fe(III), Mn(II), Yt(III), Cr(III) or Dy(III);

H, I, J, K and L are $-OH, -COO-, -CH_2OH, -CH_2COO-$, or a blocking moiety;

$R_{13} - R_{21}$ are hydrogen, alkyl, substituted alkyl, phosphorus moiety or a blocking moiety;

15 wherein at least one of $R_{13} - R_{21}, H, I, J, K$ or L is a blocking moiety.

11. A method of magnetic resonance imaging of a cell, tissue or patient comprising administering an MRI agent according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 to a cell, tissue or patient and rendering a magnetic resonance image of said cell, tissue or patient.

add
a'
add
B²
add D⁴

add
ES

67
68